

# N-Succinimidyl 4-(Maleimidomethyl)cyclohexane-1-carboxylate

sc-212277

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

N-Succinimidyl 4-(Maleimidomethyl)cyclohexane-1-carboxylate

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY:

ChemWatch

Within the US & Canada: 877-715-9305

Outside the US & Canada: +800 2436 2255

(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

C16-H18-N2-O6, "4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxysuccinimide"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

|               |   | Min | Max |
|---------------|---|-----|-----|
| Flammability: | 1 |     |     |
| Toxicity:     | 0 |     |     |
| Body Contact: | 2 |     |     |
| Reactivity:   | 1 |     |     |
| Chronic:      | 2 |     |     |

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Irritating to eyes, respiratory system and skin.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

■ The material has NOT been classified as "harmful by ingestion".  
This is because of the lack of corroborating animal or human evidence.

##### EYE

■ This material can cause eye irritation and damage in some persons.

##### SKIN

■ This material can cause inflammation of the skin on contact in some persons.  
■ The material may accentuate any pre-existing dermatitis condition.  
■ Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.  
■ Open cuts, abraded or irritated skin should not be exposed to this material.  
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.  
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

■ The material can cause respiratory irritation in some persons.  
The body's response to such irritation can cause further lung damage.  
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

#### CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.  
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.  
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME                                                       | CAS RN     | %   |
|------------------------------------------------------------|------------|-----|
| 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy | 64987-85-5 | >98 |

## Section 4 - FIRST AID MEASURES

##### SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

##### EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

##### SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

##### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

#### NOTES TO PHYSICIAN

■ Treat symptomatically.

## Section 5 - FIRE FIGHTING MEASURES

|                             |                |
|-----------------------------|----------------|
| Vapour Pressure (mmHG):     | Negligible     |
| Upper Explosive Limit (%):  | Not available. |
| Specific Gravity (water=1): | Not available  |
| Lower Explosive Limit (%):  | Not available  |

### EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

### FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

Respirator:

Particulate

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing dust and contact with skin and eyes.

### MAJOR SPILLS

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

- Do NOT cut, drill, grind or weld such containers.
- In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

### STORAGE REQUIREMENTS

- Store at -20° C.
  - Store in original containers.
  - Keep containers securely sealed.
- Light- and moisture sensitive.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

| Source                                                                    | Material                                                                                                                                           | TWA<br>ppm | TWA<br>mg/m³ | STEL<br>ppm | STEL<br>mg/m³ | Peak<br>ppm | Peak<br>mg/m³ | TWA<br>F/CC | Notes                                                                                                                                                                           |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------|-------------|---------------|-------------|---------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Canada - Ontario Occupational Exposure Limits                             | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particles (Insoluble or Poorly Soluble) Not Otherwise)                                 |            | 10 (I)       |             |               |             |               |             |                                                                                                                                                                                 |
| Canada - British Columbia Occupational Exposure Limits                    | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))               |            | 10 (N)       |             |               |             |               |             |                                                                                                                                                                                 |
| Canada - Ontario Occupational Exposure Limits                             | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Specified (PNOS) / Particules (insolubles ou peu solubles) non précisées par ailleurs) |            | 3 (R)        |             |               |             |               |             |                                                                                                                                                                                 |
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particulates not otherwise regulated Respirable fraction)                              |            | 5            |             |               |             |               |             |                                                                                                                                                                                 |
| US - California Permissible Exposure Limits for Chemical Contaminants     | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particulates not otherwise regulated Respirable fraction)                              |            | 5            |             |               |             |               |             | (n)                                                                                                                                                                             |
| US - Oregon Permissible Exposure Limits (Z-1)                             | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particulates not otherwise regulated (PNOR) (f) Total Dust)                            | -          | 10           |             |               |             |               |             | Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated." |
| US - Michigan Exposure Limits for Air Contaminants                        | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particulates not otherwise regulated, Respirable dust)                                 |            | 5            |             |               |             |               |             |                                                                                                                                                                                 |
| US - Oregon Permissible Exposure Limits (Z-1)                             | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particulates not otherwise regulated (PNOR) (f) Respirable Fraction)                   | -          | 5            |             |               |             |               |             | Bold print identifies substances for which the Oregon Permissible Exposure Limits                                                                                               |

(PELs) are different than the federal Limits. PNOR means "particles not otherwise regulated."

|                                                                                  |                                                                                                                                  |    |                                     |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----|-------------------------------------|
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particulates not otherwise regulated (PNOR)(f)- Respirable fraction) | 5  |                                     |
| Canada - Prince Edward Island Occupational Exposure Limits                       | 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)   | 10 | See Appendix B current TLV/BEI Book |

ENDOELTABLE

## PERSONAL PROTECTION



### RESPIRATOR

•Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

### EYE

- Safety glasses with side shields.
- Chemical goggles.

### HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

· Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

## ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

|                           |                |                                |                |
|---------------------------|----------------|--------------------------------|----------------|
| State                     | Divided solid  | Molecular Weight               | 334.33         |
| Melting Range (°F)        | 356- 360       | Viscosity                      | Not Applicable |
| Boiling Range (°F)        | Not available  | Solubility in water (g/L)      | Reacts         |
| Flash Point (°F)          | Not available  | pH (1% solution)               | Not applicable |
| Decomposition Temp (°F)   | Not available. | pH (as supplied)               | Not applicable |
| Autoignition Temp (°F)    | Not available  | Vapour Pressure (mmHG)         | Negligible     |
| Upper Explosive Limit (%) | Not available. | Specific Gravity (water=1)     | Not available  |
| Lower Explosive Limit (%) | Not available  | Relative Vapor Density (air=1) | Not Applicable |
| Volatile Component (%vol) | Negligible     | Evaporation Rate               | Not applicable |

### APPEARANCE

White powder; may decompose in moist air/ water.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

■ Segregate from alcohol, water.

Avoid reaction with oxidizing agents.

- NOTE: May develop pressure in containers; open carefully. Vent periodically.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy

### TOXICITY AND IRRITATION

#### 4-(MALEIMIDOMETHYL)-1-CYCLOHEXANECARBOXYLIC ACID N-HYDROXY:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

No significant acute toxicological data identified in literature search.

## Section 12 - ECOLOGICAL INFORMATION

No data

### Ecotoxicity

Ingredient

Persistence:

Persistence: Air Bioaccumulation

Mobility

|                                                            |                        |                      |     |     |
|------------------------------------------------------------|------------------------|----------------------|-----|-----|
| 4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy | Water/Soil<br>acidHIGH | No Data<br>Available | LOW | MED |
|------------------------------------------------------------|------------------------|----------------------|-----|-----|

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

**4-(maleimidomethyl)-1-cyclohexanecarboxylic acid N-hydroxy (CAS: 64987-85-5) is found on the following regulatory lists;**

"Canada - British Columbia Occupational Exposure Limits", "Canada - Ontario Occupational Exposure Limits", "Canada - Prince Edward Island Occupational Exposure Limits", "Canada National Pollutant Release Inventory (NPRI)", "US - California Permissible Exposure Limits for Chemical Contaminants", "US - Michigan Exposure Limits for Air Contaminants", "US - Oregon Permissible Exposure Limits (Z-1)", "US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants", "US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants"

## Section 16 - OTHER INFORMATION

### LIMITED EVIDENCE

■ Cumulative effects may result following exposure\*.

\* (limited evidence).

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

[www.chemwatch.net/references](http://www.chemwatch.net/references).

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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